

What is claimed is:

1 1. A method of forming a printed circuit card wherein
2 there is a metal layer sandwiched between a pair of dielectric
3 layers and wherein there is a border therearound, in which
4 said metal layer terminates at a distance spaced from the edge
5 of one of the dielectric layers comprising the steps of;

6 providing a layer of metal having opposite sides;

7 providing first and second layers of photoimageable,
8 curable dielectric material on the opposite sides of said
9 layer of metal;

10 photopatterning said first and second layers of said
11 curable photoimageable material in a pre-selected pattern, the
12 pattern on said first layer of photoimageable material
13 including a border pattern, and the pattern on said second
14 layer of said photoimageable material being free of a border
15 pattern;

16 thereafter developing said patterns on said first
17 and second layers of said photoimageable material to reveal
18 portions of said metal layer through vias and said border in
19 the developed pattern;

20 thereafter metalizing each of said first and said
21 second layers to form circuitry on said first and second
22 layers of said photoimageable material and vias in said first
23 and second layers of photoimageable material with
24 photolithographic techniques and etching the metal exposed at
25 said border through said first layer to thereby provide a
26 substrate which has an edge defined by the second layer of
27 said photoimageable material extending beyond the edge of said
28 metal layer.

1 2. The invention as defined in claim 1 further
2 characterized by photoforming a hole extending through both of

3 said layers of dielectric material and said metal layer, and
4 depositing metal in said hole.

1 3. The invention as defined in claim 1 wherein said
2 metal layer between said layers of dielectric material is
3 copper.

1 4. The invention as defined in claim 1 wherein said
2 photoimageable material is an epoxy-based resin.

1 5. The invention as defined in claim 1 wherein the
2 metal exposed at said border is etched following the
3 metalization of the first and second layers.

1 6. The invention as defined in claim 3 wherein the
2 metalization of the first and second layers is accomplished by
3 electroless plating of copper.

1 7. The invention as defined in claim 1 wherein a
2 plurality of circuit boards are formed on a panel.

1 8. The invention as defined in claim 1 wherein said
2 first and second layers of photoimageable material are applied
3 as a dry film material.

1 9. The invention as defined in claim 2 further
2 characterized by forming an opening in said metal layer prior
3 to providing the first and second layers of photoimageable
4 material, filling said opening with said photoimageable
5 material, forming a hole in the photoimageable material
6 through the metal layer opening, and providing metal in said
7 hole in said photoimageable material filling said opening.

1 10. A printed circuit card comprising a metal layer
2 sandwiched between a pair of dielectric layers, said
3 dielectric layers each being formed of a photoimaged cured
4 dielectric material and each having an outer edge, a border
5 surrounding said circuit card, said border being comprised of
6 said metal layer terminating at a distance spaced from the
7 edge of one of the dielectric layers and adjacent the edge of
8 said other dielectric layer;

9 metalization on each of said first and said second layers
10 forming circuitry on said first and second layers of said
11 photoimageable material, and metal filled vias in said first
12 and second layers of photoimageable material connected to said
13 circuitry and to said metal layer.

1 11. The invention as defined in claim 10 further
2 characterized by a plated through hole extending through each
3 layer of dielectric material and through the metal layer.

1 12. The invention as defined in claim 11 wherein said
2 plated through hole is electrically connected to the circuitry
3 on both dielectric materials.

1 13. The invention as defined in claim 10 wherein a
2 plurality of circuit boards comprise a panel connected by the
3 borders at said one dielectric layer of material.

1 14. The invention as defined in claim 10 wherein the
2 layer of metal is copper.

1 15. The invention as defined in claim 10 wherein the
2 circuitry is copper.

1 16. A method of forming a printed circuit card
2 comprising the steps of,

3 providing a layer of metal having opposite sides,
4 forming at least one opening through said layer of
5 metal,

6 provide first and second layers of photoimageable
7 material on opposite sides of said layer of metal,

8 photopatterning and developing said first and second
9 layers of said photoimageable material to form an opening
10 extending through both layers of said photoimageable material
11 and said at least one opening in said metal layer and which
12 openings in said photoimageable layers are smaller than the
13 opening in said layer of metal, forming and at least one via
14 in at least one layer of photoimageable material that
15 terminates at said layer of metal, circuitizing the exposed
16 surface of each of said layers of photoimageable material with
17 circuitry and depositing metal in said at least one hole in
18 said photoimageable material and in said at least one via.

1 17. The invention as defined in claim 16 wherein said
2 photoimageable material is deposited as a dry film.

1 18. The invention as defined in claim 16 wherein said
2 circuitry is formed by additive plating.

1 19. A printed circuit card comprising a metal layer
2 sandwiched between a pair of dielectric layers, said
3 dielectric layers each being formed of a photoimaged cured
4 dielectric material,

5 metalization on each of said first and said second
6 layers forming circuitry on said first and second layers of
7 said photoimageable material, and metal filled vias in at
8 least said first layer of photoimageable material connected to

9 said circuitry and to said metal layer and an opening in said
10 metal layer and in said first and second layers of
11 photoimageable material, said opening being metallized to
12 connect at least a portion of the circuitry on said first
13 layer with a portion of circuitry on said second layer without
14 contacting said metal layer.

1 20. The invention as defined in claim 19 wherein said
2 holes and vias in said dielectric material are photoformed.

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